

## ABSTRACT OF THE DISCLOSURE

Tape drive systems and methods for operating tape drive systems are provided. The system includes a head assembly having a head element for reading or writing data to a magnetic tape medium, and a pressure sensor coupled to the head element, the pressure sensor configured to generate a pressure signal representative of a pressure applied by the head element onto the pressure sensor. In some embodiments, an accelerometer is provided for sensing an acceleration of the head assembly and for generating a acceleration signal representative of an acceleration experienced by the head assembly. The method includes passing a tape medium between a take-up reel and a supply reel such that a tension in the tape medium causes the tape medium to apply a pressure onto a head element, and using a pressure sensor to detect a pressure applied by the head element onto the pressure sensor.